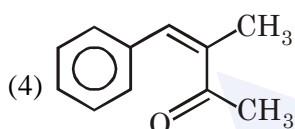
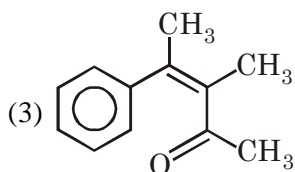
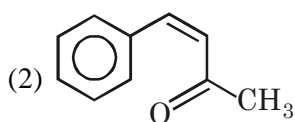
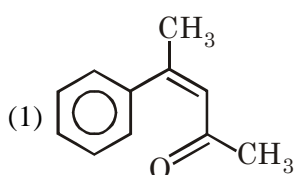
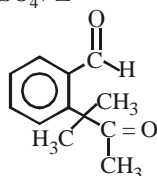
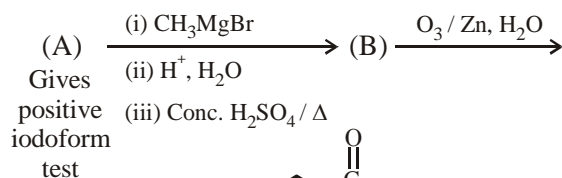
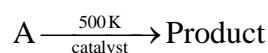
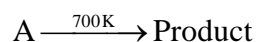


FINAL JEE-MAIN EXAMINATION – JANUARY, 2020
(Held On Thursday 09th JANUARY, 2020) TIME : 9 : 30 AM to 12 : 30 PM
CHEMISTRY

1. Identify (A) in the following reaction sequence :


NTA Ans. (4)
ALLEN Ans. (4)

2. For the following reactions



it was found that E_a is decreased by 30 kJ/mol in the presence of catalyst.

If the rate remains unchanged, the activation energy for catalysed reaction is (Assume pre exponential factor is same):

- (1) 135 kJ/mol (2) 105 kJ/mol
 (3) 198 kJ/mol (4) 75 kJ/mol

NTA Ans. (4)
ALLEN Ans. (4)
TEST PAPER WITH ANSWER

3. The correct order of heat of combustion for following alkadienes is :



- (1) (a) < (b) < (c) (2) (b) < (c) < (a)
 (3) (c) < (b) < (a) (4) (a) < (c) < (b)

NTA Ans. (1)
ALLEN Ans. (1)

4. A chemist has 4 samples of artificial sweetener A, B, C and D. To identify these samples, he performed certain experiments and noted the following observations :

- (i) A and D both form blue-violet colour with ninhydrin.
 (ii) Lassaigne extract of C gives positive AgNO_3 test and negative $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$ test.
 (iii) Lassaigne extract of B and D gives positive sodium nitroprusside test

Based on these observations which option is correct ?

- (1) A : Aspartame ; B : Saccharin ;
 C : Sucralose ; D ; Alitame
 (2) A : Alitame ; B : Saccharin ;
 C : Aspartame ; D ; Sucralose
 (3) A : Saccharin ; B : Alitame ;
 C : Sucralose ; D ; Aspartame
 (4) A : Aspartame ; B : Alitame ;
 C : Saccharin ; D ; Sucralose

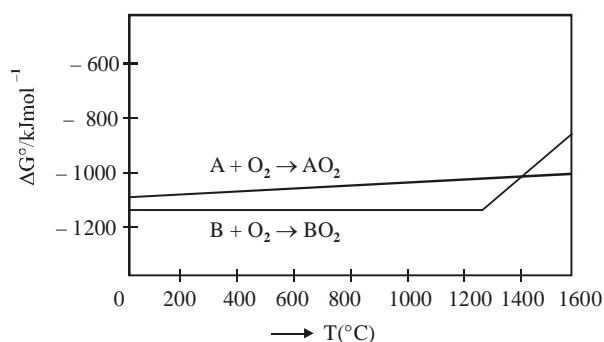
NTA Ans. (1)
ALLEN Ans. (1)

5. 'X' melts at low temperature and is a bad conductor of electricity in both liquid and solid state. X is :
- (1) Carbon tetrachloride
 - (2) Mercury
 - (3) Silicon carbide
 - (4) Zinc sulphide

NTA Ans. (1)

ALLEN Ans. (1)

6. According to the following diagram, A reduces BO_2 when the temperature is :

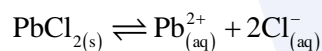


- (1) $< 1400\text{ }^\circ\text{C}$
- (2) $> 1400\text{ }^\circ\text{C}$
- (3) $< 1200\text{ }^\circ\text{C}$
- (4) $> 1200\text{ }^\circ\text{C}$ but $< 1400\text{ }^\circ\text{C}$

NTA Ans. (2)

ALLEN Ans. (2)

7. The K_{sp} for the following dissociation is 1.6×10^{-5}



Which of the following choices is correct for a mixture of 300 mL 0.134 M $\text{Pb}(\text{NO}_3)_2$ and 100 mL 0.4 M NaCl ?

- (1) $Q < K_{sp}$
- (2) $Q > K_{sp}$
- (3) $Q = K_{sp}$
- (4) Not enough data provided

NTA Ans. (2)

ALLEN Ans. (2)

8. $[\text{Pd}(\text{F})(\text{Cl})(\text{Br})(\text{I})]^{2-}$ has n number of geometrical isomers. Then, the spin-only magnetic moment and crystal field stabilisation energy [CFSE] of $[\text{Fe}(\text{CN})_6]^{n-6}$, respectively, are:

[Note : Ignore the pairing energy]

- (1) 2.84 BM and $-1.6 \Delta_0$
- (2) 1.73 BM and $-2.0 \Delta_0$
- (3) 0 BM and $-2.4 \Delta_0$
- (4) 5.92 BM and 0

NTA Ans. (2)

ALLEN Ans. (2)

9. If the magnetic moment of a dioxygen species is 1.73 B.M, it may be :

- (1) O_2^- or O_2^+
- (2) O_2 or O_2^+
- (3) O_2 or O_2^-
- (4) O_2 , O_2^- or O_2^+

NTA Ans. (1)

ALLEN Ans. (1)

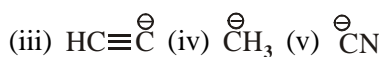
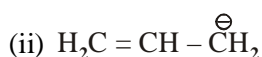
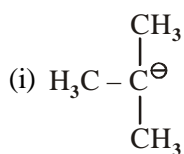
10. If enthalpy of atomisation for $\text{Br}_{2(l)}$ is x kJ/mol and bond enthalpy for Br_2 is y kJ/mol, the relation between them :

- (1) is $x = y$
- (2) is $x < y$
- (3) does not exist
- (4) is $x > y$

NTA Ans. (4)

ALLEN Ans. (4)

11. The increasing order of basicity for the following intermediates is (from weak to strong)



- (1) (v) < (i) < (iv) < (ii) < (iii)
 (2) (iii) < (i) < (ii) < (iv) < (v)
 (3) (v) < (iii) < (ii) < (iv) < (i)
 (4) (iii) < (iv) < (ii) < (i) < (v)

NTA Ans. (3)

ALLEN Ans. (3)

12. B has a smaller first ionization enthalpy than Be. Consider the following statements :

- (I) It is easier to remove 2p electron than 2s electron
 (II) 2p electron of B is more shielded from the nucleus by the inner core of electrons than the 2s electrons of Be.
 (III) 2s electron has more penetration power than 2p electron.
 (IV) atomic radius of B is more than Be (Atomic number B = 5, Be = 4)

The correct statements are :

- (1) (I), (II) and (III)
 (2) (II), (III) and (IV)
 (3) (I), (III) and (IV)
 (4) (I), (II) and (IV)

NTA Ans. (1)

ALLEN Ans. (1)

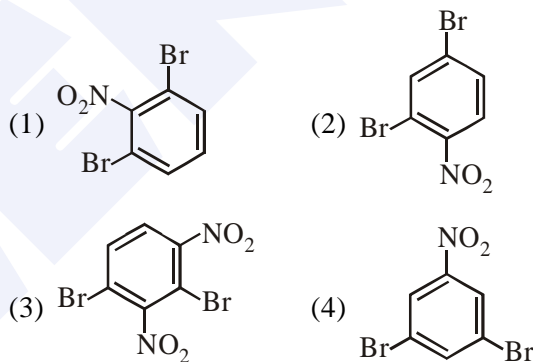
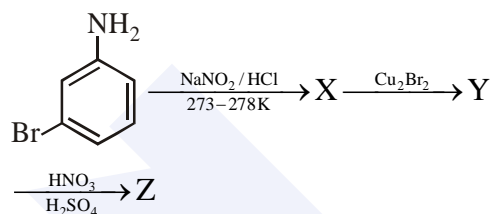
13. The acidic, basic and amphoteric oxides, respectively, are :

- (1) MgO, Cl₂O, Al₂O₃
 (2) Cl₂O, CaO, P₄O₁₀
 (3) Na₂O, SO₃, Al₂O₃
 (4) N₂O₃, Li₂O, Al₂O₃

NTA Ans. (4)

ALLEN Ans. (4)

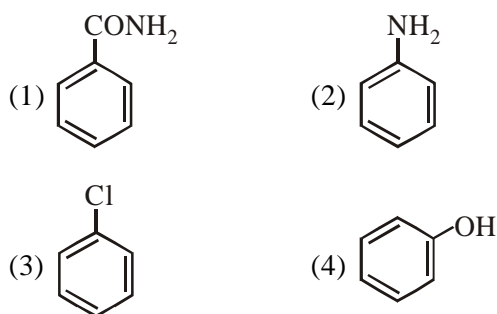
14. The major product Z obtained in the following reaction scheme is :



NTA Ans. (2)

ALLEN Ans. (2)


15. Which of these will produce the highest yield in Friedel Crafts reaction?



NTA Ans. (3)

ALLEN Ans. (3)


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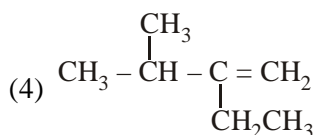
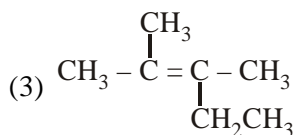
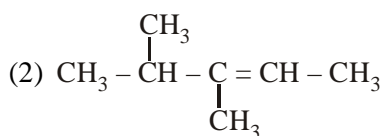
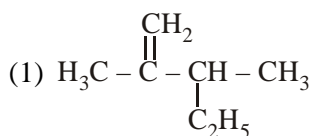
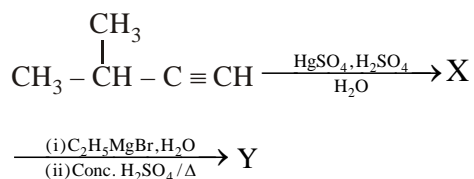
AIR
1 JEE (ADV.)
2019
Kartikey Gupta



Appear in ASAT
on 19 Jan. 2020

 0744-2757575

16. The major product (Y) in the following reactions is :



NTA Ans. (3)

ALLEN Ans. (3)

17. Complex X of composition $\text{Cr}(\text{H}_2\text{O})_6\text{Cl}_n$ has a spin only magnetic moment of 3.83 BM. It reacts with AgNO_3 and shows geometrical isomerism. The IUPAC nomenclature of X is :

- (1) Tetraaquadichlorido chromium (III) chloride dihydrate
- (2) Hexaqua chromium (III) chloride
- (3) Dichloridotetraqua chromium (IV) chloride dihydrate
- (4) Tetraaquadichlorido chromium(IV) chloride dihydrate

NTA Ans. (1)

ALLEN Ans. (1)

18. The compound that cannot act both as oxidising and reducing agent is :

- (1) H_2O_2
- (2) H_2SO_3
- (3) HNO_2
- (4) H_3PO_4

NTA Ans. (4)

ALLEN Ans. (4)

19. The de Broglie wavelength of an electron in the 4th Bohr orbit is :

- (1) $8\pi a_0$
- (2) $2\pi a_0$
- (3) $4\pi a_0$
- (4) $6\pi a_0$

NTA Ans. (1)

ALLEN Ans. (1)

20. The electronic configurations of bivalent europium and trivalent cerium are (atomic number : Xe = 54, Ce = 58, Eu = 63)

- (1) $[\text{Xe}] 4f^4$ and $[\text{Xe}] 4f^9$
- (2) $[\text{Xe}] 4f^7$ and $[\text{Xe}] 4f^1$
- (3) $[\text{Xe}] 4f^7 6s^2$ and $[\text{Xe}] 4f^2 6s^2$
- (4) $[\text{Xe}] 4f^2$ and $[\text{Xe}] 4f^7$

NTA Ans. (2)

ALLEN Ans. (2)

21. The hardness of a water sample containing 10^{-3} M MgSO_4 expressed as CaCO_3 equivalents (in ppm) is _____.

(molar mass of MgSO_4 is 120.37 g/mol)

NTA Ans. (100 to 100)

ALLEN Ans. (100)

22. The molarity of HNO_3 in a sample which has density 1.4 g/mL and mass percentage of 63% is _____. (Molecular Weight of $\text{HNO}_3 = 63$)

NTA Ans. (14.00 to 14.00)

ALLEN Ans. (14)

23. 108 g of silver (molar mass 108 g mol⁻¹) is deposited at cathode from $\text{AgNO}_3(\text{aq})$ solution by a certain quantity of electricity. The volume (in L) of oxygen gas produced at 273 K and 1 bar pressure from water by the same quantity of electricity is _____.

NTA Ans. (5.66 to 5.67)

ALLEN Ans. (5.67 or 5.68)

24. The mass percentage of nitrogen in histamine is _____.

NTA Ans. (37.80 to 38.20)

ALLEN Ans. (37.84)

25. How much amount of NaCl should be added to 600 g of water ($\rho = 1.00$ g/mL) to decrease the freezing point of water to -0.2°C ? _____. (The freezing point depression constant for water = 2K kg mol^{-1})

NTA Ans. (1.74 to 1.76)

ALLEN Ans. (1.75 or 1.76)